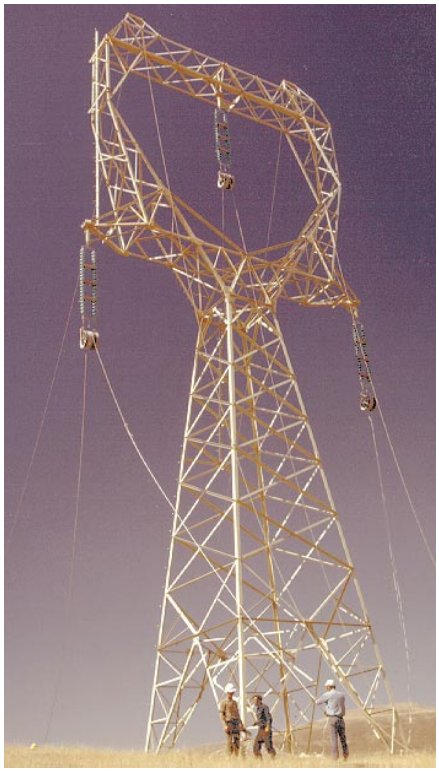
Advanced Power Technology

GOALS



- **By 2000, demonstrate coal-based power systems with efficiencies up to 45%, CO_2 reductions of 29%, SOx and NOx controls to 1/3rd NSPS, and energy costs 10-20% lower than today's plants.**
- **By 2000, develop and demonstrate a high-efficiency turbine system and one or more advanced fuel cell systems powered by natural gas with efficiencies over 60%.**
- **By 2005, achieve 48-55% efficiencies for coal-based sysems, reduce CO_2 emissions by 42%, control SOx and NOx to 1/4th NSPS, and maintain energy costs at 10-20% lower than today.**
- **By 2010, achieve 60-75% efficiencies (with advanced natural gas fuel cells and turbines), reduce CO_2 emissions by 56%, control SOx and NOx to 1/10th NSPS, and maintain 10-20% lower energy costs.**
- **By 2015, develop advanced coal-based technology (likely integrating advanced turbines/fuel cells) to achieve 58-60% efficiencies, CO_2 reductions of 47%, SOx and NOx controls to 1/10th NSPS, and 10-20% lower energy costs than today.**

Goals for the Advanced Power Systems Program are for systems demonstrated at commercial scale and ready for marketplace orders

Goals are directed at achieving (1) cost competitiveness with other options, (2) ultra-clean environmental performance, (3) high fuel-to-electricity efficiencies, (4) diminished climate change effects, (4) lowest energy costs to consumers, and (5) increased U.S. competitiveness in global markets.

Advanced Power Technology

Budget

COAL RD&D

Program Components	FY95	FY96 Conf.	FY97 Request	Cost-Sharing
Adv. Pulverized Coal-Fired Systems	$7.3	$10.6	$5.5	25%
High-Efficiency Pressurized Fluid Bed	24.8	19.5	18.0	20%
High-Efficiency Integrated Gasification Combined Cycle	25.8	22.0	22.5	20%
Indirectly Fired Cycle	11.6	11.9	11.0	20%
Advanced Research & Environmental Technology	18.2	14.3	9.8	20%
Kalina Cycle	—	2.0	—	
Total	$87.7	$80.3	$66.8	

NATURAL GAS

Program Components	FY95	FY96 Conf.	FY97 Request	Cost-Sharing
Advanced Turbine Systems	$37.0	$36.8	$31.6	50%
Fuel Cells	47.0	52.5	46.6	42%
Total	$84.0	$89.3	$78.2	

The Advanced Power Systems Program includes both coal- and natural gas-fueled electric power generating systems. In the 21st century, if the R&D program is successful, today's natural gas systems, e.g., advanced turbines and fuel cells, will also be capable of functioning in a coal-fueled power plant.

For budget purposes, the natural gas-based advanced turbine and fuel cell programs are included in the natural gas portion of the Fossil Energy budget.